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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/644,004	08/20/2003	Motoaki Tani	1504.1023	4861

21171 7590 06/18/2004

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EXAMINER

LAM, CATHY FONG FONG

ART UNIT	PAPER NUMBER
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1775

DATE MAILED: 06/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/644,004

Applicant(s)

TANI ET AL.

Examiner

Cathy Lam

Art Unit

1775

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date Aug. 20, 2003
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3, 6-8, 10-12 and 14 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Furuta et al (US 6124023).

Furuta discloses a prepreg for used in printed wiring board. The printed circuit board is comprised of conductive patterns and at least one prepreg.

The conductive patterns are formed on the surfaces of the prepreg to form a laminate (col 7 L 44-46 & Examples 6-8). Penetration through holes were formed in the thickness direction of the laminate for connection of the conductive patterns (col 1 L 15-18).

The prepreg is comprised of a woven or non-woven fabric form of carbon fibers, inorganic fillers such as aluminum hydroxide and an epoxy resin (col 6 L 8-9, col 4 L 30-34, col 3 L 19-24). The amount of filler is preferably from 50 wt% to <100 wt% of the epoxy resin (col 4 L 36-38).

Furuta teaches all the ingredients for the prepreg, thus it would be inherent that the thermal expansion coefficients in all three directions meet the limitation of claims 6 & 7.

3. Claims 1-3, 5-8, 10-12 and 14 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Nagase et al (US 5945222).

Nagase discloses a printed circuit board comprised of insulating base layer(s) and conductive patterns.

The conductive patterns are formed inside or on one or both surfaces of the insulating base layer (col 2 L 48-52). The conductive patterns on the insulating base layers formed a laminate, and a conductive through holes are formed in the laminate for connecting the conductor patterns (col 6 L 20-25 & L 43-47).

The insulating base layer is a prepreg comprised of epoxy resin, inorganic filler such as magnesium hydroxide powder & silica powder, and reinforcing fiber such as carbon fiber (col 5 L 31-32, L 9-12 & L 15). Nagase teaches that the reinforcing materials (ie. the fillers and the fibers) is in the amount from 10-300 wt% of the resin material (col 5 L 17-19).

The ingredients of the prepreg as taught by Nagase meet what is claimed by Applicant, thus inherently the CTE values of the present invention would be met by Nagase.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furuta et al (US 6124023) or Nagase et al (US 5945222) in view of Haas et al (US 6224965) or Jiang et al (US 6428942).

Both Furuta and Nagase teach a printed wiring board comprised of a single or a multiple laminate which made up of prepreg(s) and conductive layers.

The prepreg is made of a thermosetting resin such as epoxy resin, an inorganic filler and carbon fiber reinforcing material.

Furuta and Nagase however do not teach any insulating film enclosing the conductor on the core layer, nor do they teach the amount of carbon fiber used. Furuta and Nagase also do not teach the size of the inorganic fillers.

Both Haas and Jiang teach a multilayer circuit board comprised of a core layer and a plurality of insulating layers.

In Haas, the core layer (10) is a reinforcing layer over which conductive patterns (12&14) are formed. Insulating layers (16&18) are formed over the surfaces of core layer and encapsulated the conductive patterns (col 6 L 2-7 & Fig. 1).

Jiang also has the similar structure as Haas.

In view of the prior art teachings, one skill in the art would fabricate a multilayer wiring board having a core layer with his desired materials and amount of the materials because choosing the amount of fiber material and the size of the filers involve only routine experimentation.

Furthermore, having an insulating base material comprised of inorganic fillers and carbon fibers impregnated into a resin material is well known in the art because it has good heat resistance properties (col 1 L 6-7 of Nagase).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cathy Lam whose telephone number is (571) 272-1538. The examiner can normally be reached on 9am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (571) 272-1535. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Cathy Lam
Primary Examiner
Art Unit 1775

cfl
June 3, 2004